

## CLAIMS

1. A write-once read-many information recording medium, wherein:

5 at least one disc management working area is sequentially allocated in a predetermined direction;

10 in the at least one disc management working area, disc management information, which is management information about the write-once read-many information recording medium,

15 and disc definition structure containing positional information about the disc management information, are provided;

15 latest disc management information and latest disc definition structure are provided, wherein the latest disc management information precedes the latest disc definition structure in the predetermined direction;

20 the latest disc management information is disc management information provided in a recorded disc management working area neighboring a border between the recorded disc management working area and an unrecorded disc management working area;

25 the latest disc definition structure is a disc definition structure containing positional information about the latest disc management information; and

30 the latest disc definition structure is provided at a predetermined position in the recorded disc management working area neighboring the border, the predetermined position being capable of being calculated based on the border as a reference.

30 2. A write-once read-many information recording medium according to claim 1, wherein:

the disc management information has a variable size;

and

the disc definition structure has a fixed size.

3. A write-once read-many information recording medium  
5 according to claim 1, wherein:

the write-once read-many information recording medium contains a data area for recording data and a spare area, the spare area being a replacement area for the data area;

10 the disc management information contains a replacement list containing correspondence relationship information indicating a correspondence relationship between a replacement source area contained in the data area and a replacement destination area contained in the spare  
15 area; and

the disc definition structure contains replacement list positional information which is positional information about the replacement list.

20 4. A write-once read-many information recording medium according to claim 3, wherein:

the predetermined direction is a direction from an inner periphery to an outer periphery of the write-once read-many information recording medium; and

25 the latest disc definition structure is provided at a predetermined position which is capable of being calculated based on an end of the recorded disc management working area neighboring the border as a reference.

30 5. A write-once read-many information recording medium according to claim 3, wherein:

the predetermined direction is a direction from an outer periphery to an inner periphery of the write-once

read-many information recording medium; and

the latest disc definition structure is provided at a predetermined position which is capable of being calculated based on a beginning of the recorded disc management working area neighboring the border as a reference.

6. A write-once read-many information recording medium according to claim 4, wherein:

the disc management working area contains a plurality of blocks;

each of the plurality of blocks is a unit for recording/reproducing data; and

the disc management information and the disc definition structure are provided in different blocks in the plurality of blocks.

7. A write-once read-many information recording medium according to claim 4, wherein:

the disc management working area contains one or more blocks;

each of the one or more blocks is a unit for recording/reproducing data;

the disc management information and the disc definition structure shares at least one of the one or more blocks; and

the disc definition structure is provided at a predetermined position in a predetermined block among blocks contained in the recorded disc management working area neighboring the border, the predetermined block being capable of being calculated based on the border as a reference.

8. A write-once read-many information recording medium according to claim 4, wherein:

a finalization identifying flag is recorded in the write-once read-many information recording medium; and  
the finalization identifying flag indicates prohibition of additionally recording data into the at least  
5 one disc management working area.

9. A write-once read-many information recording medium according to claim 8, wherein:

10 at least one of the disc definition structure and the disc management information contains the finalization identifying flag.

10. A write-once read-many information recording medium according to claim 4, wherein:

15 the write-once read-many information recording medium contains at least one disc management area;

in the at least one disc management area, the last disc management information and the last disc definition structure are provided;

20 the last disc management information is the latest disc management information provided in the at least one disc management area;

25 the last disc definition structure is a disc definition structure containing positional information about the last disc management information; and

30 the last disc management information and the last disc definition structure are provided from a beginning of the at least one disc management area, wherein the last disc definition structure precedes the last disc management information in the direction from the inner periphery to the outer periphery of the write-once read-many information recording medium.

11. A write-once read-many information recording medium according to claim 5, wherein:

the disc management working area contains a plurality of blocks;

5 each of the plurality of blocks is a unit for recording/reproducing data; and

the disc management information and the disc definition structure are provided in different blocks in the plurality of blocks.

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12. A write-once read-many information recording medium according to claim 5, wherein:

the disc management working area contains one or more blocks;

15 each of the one or more blocks is a unit for recording/reproducing data;

the disc management information and the disc definition structure shares at least one of the one or more blocks; and

20 the disc definition structure is provided at a predetermined position in a predetermined block among blocks contained in the recorded disc management working area neighboring the border, the predetermined block being capable of being calculated based on the border as a reference.

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13. A write-once read-many information recording medium according to claim 5, wherein:

a finalization identifying flag is recorded in the write-once read-many information recording medium; and

30 the finalization identifying flag indicates prohibition of additionally recording data into the at least one disc management working area.

14. A write-once read-many information recording medium according to claim 13, wherein at least one of the disc definition structure and the disc management information contains the finalization identifying flag.

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15. A write-once read-many information recording medium according to claim 5, wherein:

the write-once read-many information recording medium contains at least one disc management area;

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in the at least one disc management area, the last disc management information and the last disc definition structure are provided;

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the last disc management information is the latest disc management information provided in the at least one disc management area;

the last disc definition structure is a disc definition structure containing positional information about the last disc management information; and

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the last disc management information and the last disc definition structure are provided from a beginning of the at least one disc management area, wherein the last disc definition structure precedes the last disc management information in the direction from the inner periphery to the outer periphery of the write-once read-many information recording medium.

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16. An information recording method for recording information onto a write-once read-many information recording medium, wherein

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at least one disc management working area is sequentially provided in a predetermined direction on the write-once read-many information recording medium,

the information recording method comprising the

steps of:

(a) selecting an unrecorded disc management working area neighboring a border between a recorded disc management working area and the unrecorded disc management working area;

5 (b) recording disc management information, which is management information about the write-once read-many information recording medium, into the unrecorded disc management working area neighboring the border; and

10 (c) recording a disc definition structure containing positional information about the disc management information recorded in the step (b) into the unrecorded disc management working area neighboring the border,

15 wherein the disc management information and the disc definition structure are provided in the predetermined direction, the disc management information preceding the disc definition structure in the predetermined direction, and

20 the disc definition structure is provided at a predetermined position in the unrecorded disc management working area neighboring the border, the predetermined position being capable of being calculated based on the border as a reference.

25 17. An information recording method according to claim 16, wherein the disc management information has a variable size and the disc definition structure has a fixed size.

30 18. An information recording method according to claim 16, wherein:

the write-once read-many information recording medium contains a data area for recording data and a spare area, the spare area being a replacement area for the data area;

the disc management information contains a replacement list containing correspondence relationship information indicating a correspondence relationship between a replacement source area contained in the data area and a replacement destination area contained in the spare area; and

the disc definition structure contains replacement list positional information which is positional information about the replacement list.

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19. An information recording method according to claim 16, wherein:

the predetermined direction is a direction from an inner periphery to an outer periphery of the write-once read-many information recording medium; and

the disc definition structure containing the positional information about the disc management information recorded in the step (b) is provided at a predetermined position which is capable of being calculated based on an end of the unrecorded disc management working area neighboring the border as a reference.

20. An information recording method according to claim 16, wherein:

the predetermined direction is a direction from an outer periphery to an inner periphery of the write-once read-many information recording medium; and

the disc definition structure containing the positional information about the disc management information recorded in the step (b) is provided at a predetermined position which is capable of being calculated based on a beginning of the unrecorded disc management working area neighboring the border as a reference.

21. An information recording method according to claim 19, wherein:

5 the step (b) further comprises determining whether or not the recording of the disc management information has been normally performed;

10 the step (c) further comprise determining whether or not the recording of the disc definition structure has been normally performed; and

15 the information recording method further comprises the step of:

20 (d) repeatedly performing the step (b) until the recording of the disc management information is normally performed, and repeatedly performing the step (c) until the recording of the disc definition structure is normally performed.

22. An information recording method according to claim 20, wherein:

25 the step (b) further comprises determining whether or not the recording of the disc management information has been normally performed;

30 the step (c) further comprises determining whether or not the recording of the disc definition structure has been normally performed; and

35 the information recording method further comprises the step of:

(d) repeatedly performing the step (b) until the recording of the disc management information is normally performed, and repeatedly performing the step (c) until the recording of the disc definition structure is normally performed.

23. An information reproduction method for reproducing information from a write-once read-many information recording medium, wherein:

5 at least one disc management working area is sequentially allocated in a predetermined direction on the write-once read-many information recording medium;

10 in the at least one disc management working area, disc management information, which is management information about the write-once read-many information recording medium, and disc definition structure containing positional information about the disc management information, are provided;

15 latest disc management information and latest disc definition structure are provided in the predetermined direction, the latest disc management information preceding the latest disc definition structure in the predetermined direction;

20 the latest disc management information is disc management information provided in a recorded disc management working area neighboring a border between the recorded disc management working area and an unrecorded disc management working area;

25 the latest disc definition structure is a disc definition structure containing positional information about the latest disc management information;

30 the latest disc definition structure is provided at a predetermined position in the recorded disc management working area neighboring the border, the predetermined position being capable of being calculated based on the border as a reference,

the information reproduction method comprising the steps of:

(a) searching for a position of the border to obtain

border positional information indicating the position of the border;

(b) reproducing the latest disc definition structure based on the border positional information;

5 (c) obtaining positional information about the latest disc management information based on the latest disc definition structure; and

10 (d) reproducing the disc management information based on the positional information about the latest disc management information.

24. An information reproduction method according to claim 23, wherein the disc management information has a variable size and the disc definition structure has a fixed size.

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25. An information reproduction method according to claim 23, wherein:

20 the write-once read-many information recording medium contains a data area for recording data and a spare area, the spare area being a replacement area for the data area;

25 the disc management information contains a replacement list containing correspondence relationship information indicating a correspondence relationship between a replacement source area contained in the data area and a replacement destination area contained in the spare area; and

30 the disc definition structure contains replacement list positional information which is positional information about the replacement list.

26. An information reproduction method according to claim 25, wherein:

the predetermined direction is a direction from an inner periphery to an outer periphery of the write-once read-many information recording medium; and

5 the latest disc definition structure is provided at a predetermined position which is capable of being calculated based on an end of the recorded disc management working area neighboring the border as a reference.

10 27. An information reproduction method according to claim 25, wherein:

the predetermined direction is a direction from an outer periphery to an inner periphery of the write-once read-many information recording medium; and

15 the latest disc definition structure is provided at a predetermined position which is capable of being calculated based on a beginning of the recorded disc management working area neighboring the border as a reference.

20 28. An information recording apparatus for recording information onto a write-once read-many information recording medium, wherein

25 at least one disc management working area is sequentially provided in a predetermined direction on the write-once read-many information recording medium,

the information recording apparatus comprising:

(a) a section for selecting an unrecorded disc management working area neighboring a border between a recorded disc management working area and the unrecorded disc management working area;

30 (b) a section for recording disc management information, which is management information about the write-once read-many information recording medium, into the unrecorded disc management working area neighboring the

border;

5 (c) a section for recording a disc definition structure containing positional information about the disc management information recorded in the step (b) into the unrecorded disc management working area neighboring the border,

10 wherein the disc management information and the disc definition structure are provided in the predetermined direction, the disc management information preceding the disc definition structure in the predetermined direction, and

15 the disc definition structure is provided at a predetermined position in the unrecorded disc management working area neighboring the border, the predetermined position being capable of being calculated based on the border as a reference.

20 29. An information recording apparatus according to claim 28, wherein the disc management information has a variable size and the disc definition structure has a fixed size.

30 30. An information recording apparatus according to claim 28, wherein:

25 the write-once read-many information recording medium contains a data area for recording data and a spare area, the spare area being a replacement area for the data area;

30 the disc management information contains a replacement list containing correspondence relationship information indicating a correspondence relationship between a replacement source area contained in the data area and a replacement destination area contained in the spare area; and

the disc definition structure contains replacement list positional information which is positional information about the replacement list.

5 31. An information recording apparatus according to claim 28, wherein:

the predetermined direction is a direction from an inner periphery to an outer periphery of the write-once read-many information recording medium; and

10 the disc definition structure containing the positional information about the disc management information recorded by the section (b) is provided at a predetermined position which is capable of being calculated based on an end of the unrecorded disc management working area  
15 neighboring the border as a reference.

32. An information recording apparatus according to claim 28, wherein:

20 the predetermined direction is a direction from an outer periphery to an inner periphery of the write-once read-many information recording medium; and

25 the disc definition structure containing the positional information about the disc management information recorded by the section (b) is provided at a predetermined position which is capable of being calculated based on a beginning of the unrecorded disc management working area neighboring the border as a reference.

33. An information recording apparatus according to claim 31, wherein:

the section (b) further comprises a section for determining whether or not the recording of the disc management information has been normally performed;

the section (c) further comprise a section for determining whether or not the recording of the disc definition structure has been normally performed; and  
the information recording apparatus further  
5 comprises:

(d) a section for repeatedly performing recording of the disc management information until the recording of the disc management information is normally performed, and repeatedly performing recording of the disc definition  
10 structure until the recording of the disc definition structure is normally performed.

34. An information recording apparatus according to claim 32, wherein:

15 the section (b) further comprises a section for determining whether or not the recording of the disc management information has been normally performed;

the section (c) further comprises a section for determining whether or not the recording of the disc definition structure has been normally performed; and  
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the information recording apparatus further comprises:

(d) a section for repeatedly performing recording of the disc management information until the recording of the disc management information is normally performed, and repeatedly performing recording of the disc definition structure until the recording of the disc definition  
25 structure is normally performed.

30 35. An information reproduction apparatus for reproducing information from a write-once read-many information recording medium, wherein:

at least one disc management working area is

sequentially allocated in a predetermined direction on the write-once read-many information recording medium;

in the at least one disc management working area, disc management information, which is management information about the write-once read-many information recording medium, and disc definition structure containing positional information about the disc management information, are provided;

10 latest disc management information and latest disc definition structure are provided in the predetermined direction, the latest disc management information preceding the latest disc definition structure in the predetermined direction;

15 the latest disc management information is disc management information provided in a recorded disc management working area neighboring a border between the recorded disc management working area and an unrecorded disc management working area;

20 the latest disc definition structure is a disc definition structure containing positional information about the latest disc management information;

25 the latest disc definition structure is provided at a predetermined position in the recorded disc management working area neighboring the border, the predetermined position being capable of being calculated based on the border as a reference,

the information reproduction apparatus comprising:

30 (a) a section for searching for a position of the border to obtain border positional information indicating the position of the border;

(b) a section for reproducing the latest disc definition structure based on the border positional information;

(c) a section for obtaining positional information about the latest disc management information based on the latest disc definition structure; and

5 (d) a section for reproducing the disc management information based on the positional information about the latest disc management information.

10 36. An information reproduction apparatus according to claim 35, wherein the disc management information has a variable size and the disc definition structure has a fixed size.

15 37. An information reproduction apparatus according to claim 35, wherein:

the write-once read-many information recording medium contains a data area for recording data and a spare area, the spare area being a replacement area for the data area;

20 the disc management information contains a replacement list containing correspondence relationship information indicating a correspondence relationship between a replacement source area contained in the data area and a replacement destination area contained in the spare area; and

25 the disc definition structure contains replacement list positional information which is positional information about the replacement list.

30 38. An information reproduction apparatus according to claim 37, wherein:

the predetermined direction is a direction from an inner periphery to an outer periphery of the write-once read-many information recording medium; and

the latest disc definition structure is provided at a predetermined position which is capable of being calculated based on an end of the recorded disc management working area neighboring the border as a reference.

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39. An information reproduction apparatus according to claim 37, wherein:

the predetermined direction is a direction from an outer periphery to an inner periphery of the write-once 10 read-many information recording medium; and

the latest disc definition structure is provided at a predetermined position which is capable of being calculated based on a beginning of the recorded disc management working area neighboring the border as a reference.